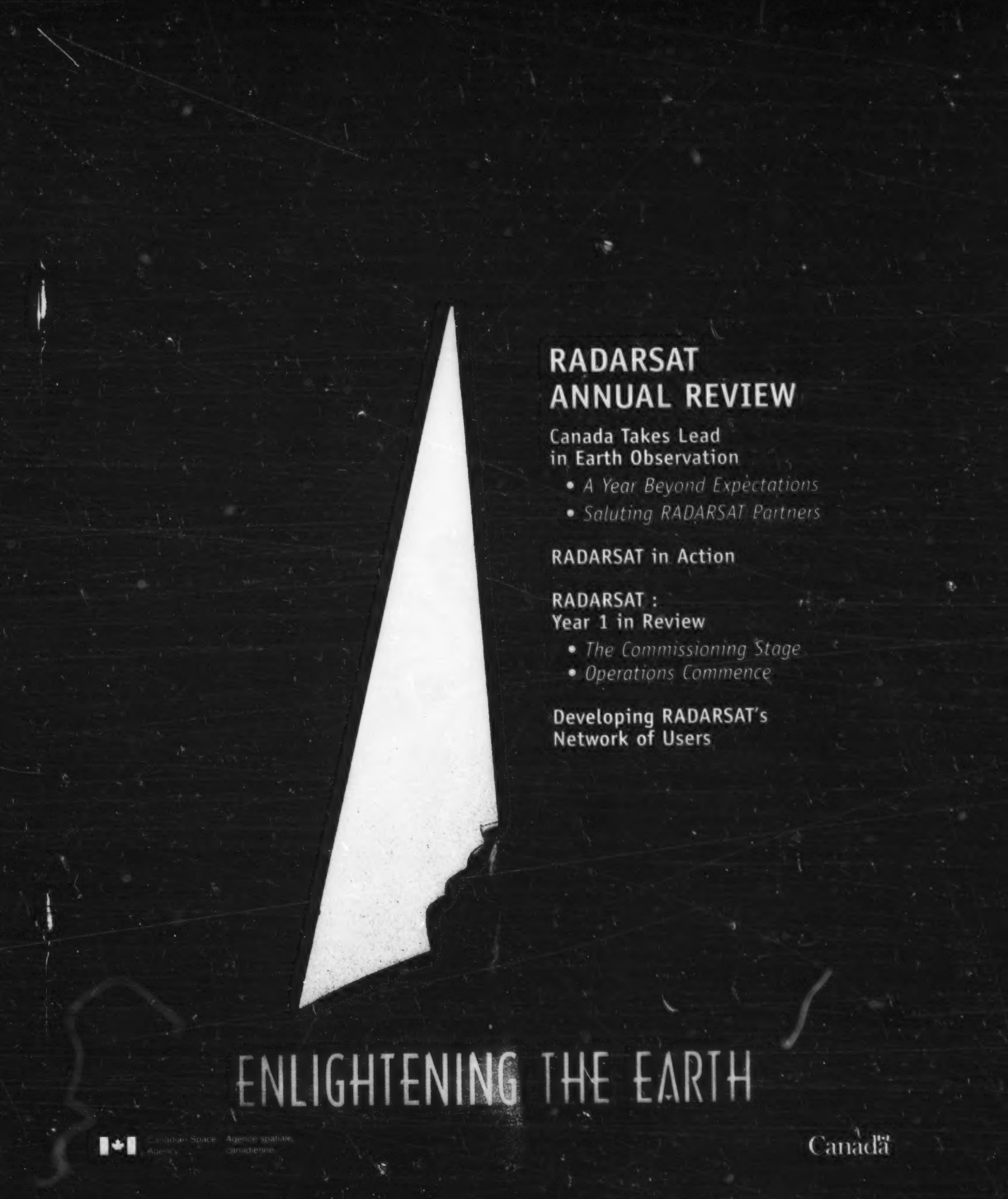
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ENLIGHTENING THE EARTH
Canadian Space Agency
Agence spatiale canadienne
Canada

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Canada Takes the Lead in Earth Observation

Message from
W. M. (Mac) Evans,

President of the Canadian Space Agency

This annual review covers a landmark period for RADARSAT, Canada's first Earth Observation satellite. It began, on November 4, 1995, when we celebrated the perfect launch of the satellite, followed by the commencement of operations, on April 1, 1996, when we officially declared RADARSAT "Open for Business." After a year in operation, we can proudly say that this space technology is performing beyond specifications. It is succeeding not only as expected, but also as hoped, and in ways we never imagined. Moreover, the space system is attracting commercial clients the world over, as more and more companies learn how to put RADARSAT knowledge to profitable use.

The Canadian Space Agency (CSA), in recognition of the growing worldwide thrust towards global environmental monitoring and protection, has established Earth Observation as a key priority of the Canadian Space Program, and developed RADARSAT as the flagship to purse that priority. In addition to being a driving force in the Earth Observation industry, translating into more jobs for Canadians, RADARSAT is saving government money by putting space technology to work to offer more cost-effective, higher-value essential services to the public.

Fundamental to the success of RADARSAT are the unique partnerships behind it. Credit for RADARSAT's milestones is also due to other government departments like the Canada Centre for Remote Sensing, numerous provincial and international governments, and Canada's vibrant Earth Observation industry, particularly RADARSAT International Inc. which is actively marketing RADARSAT data around the globe and establishing world leadership in the field.

The successful first year of operations of RADARSAT illustrates how this country's space program is helping to develop a niche for Canadian companies in the global market. The CSA is proud to be part of these achievements and hope you enjoy this review of Canada's success and leadership in a space-based, rapidly growing knowledge industry.

A Year Beyond Expectations

Message from Rolf Mamen

Director-General,
Space Operations

In its first full year of operation, RADARSAT performed beyond specifications. As it fulfilled over 11,000 image requests, it won new users in many diverse fields. It proved its value in fields ranging from pollution fighting to safe navigation to food production.

Where satellite data could help, RADARSAT was first on the scene: to help ships trapped in ice, to support the fight against oil spills, to provide extensive monitoring of river flooding, and perform other urgent tasks.

Where an optical satellite view can help, a radar image goes beyond. RADARSAT images found eager buyers among mining and oil & gas exploration companies. They helped to find groundwater, to monitor forests and croplands.

Where governments need vital and timely information to support activities from land use planning to ice patrols, RADARSAT is delivering — helping governments to provide more effective services at lower cost. For example, the Canadian Ice Service (CIS) alone expects to save approximately $15 million over five years by using RADARSAT data in place of much of the aircraft reconnaissance previously required. In the annual preparation of CIS's Arctic Winter Ice Atlas, for example, RADARSAT provided 15 times the geographic coverage at less than half the cost.

For a country like Canada, with its vast geography, and striking variety of landscapes and climatic conditions, RADARSAT is an especially valuable tool. With RADARSAT, the satellite equipped with a Synthetic Aperture Radar (SAR) that can acquire images at any time in selectable resolutions, Canada is giving itself world leadership in Earth Observation technology. And it is building on previous Canadian achievements and experience in SAR sensor development, participation in NASA's SEASAT project, and working with the European Space Agency in the ERS SAR missions.

Having the world's most advanced operational Earth Observation satellite is bringing major economic benefits to Canada. The Earth Observation market is growing rapidly, as the use of satellite data finds its way into more and more activities. By the year 2000, worldwide sales of all remote sensing data are expected to reach $1 billion, and sales of value-added products and services $9 billion.

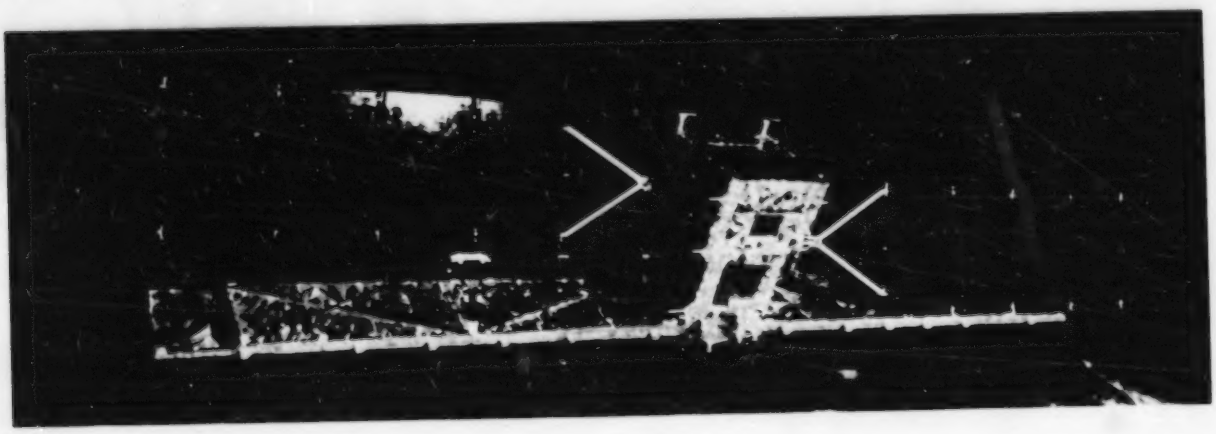
Over its 5-year mission RADARSAT — with a powerful, reliable Earth Observation system, RSI's determined marketing, and programs to develop applications in many fields — aims to capture a 20% share of this market. In the 1st Quarter 1997 RADARSAT sales exceeded projections by 15%. — and RADARSAT was well on the way to securing Canada's place in the front ranks of a growing, high-potential and truly global knowledge industry.

Saluting RADARSAT Partners

Of necessity, space activities are multipartite, multilateral and international in nature, in order to share costs and bring together diverse expertise and resources. In this tradition, the Canadian Space Agency is responsible for RADARSAT's implementation and operation, and a tremendous range of partners — other federal departments, a strong industry, Canadian provinces, and international partners — share the responsibility for its success.

The Canada Centre for Remote Sensing (CCRS) is an important partner in RADARSAT. It houses a vast knowledge in the field of remote sensing, and has built a high reputation in the international Earth Observation community. CCRS operates the two RADARSAT ground facilities in Prince Albert, Saskatchewan and Gatineau, Québec.

RADARSAT is Canada's first Earth Observation satellite, and reflects our country's priority of utilizing space to obtain benefits on Earth. Since it scans the Earth by Synthetic Aperture Radar (SAR), darkness and clouds are no barrier. This has helped it to establish an international reputation as the most reliable and rapid source of satellite data. RADARSAT also has an unmatched range of radar scanning options.



Four Canadian provincial governments, Québec, Saskatchewan, Ontario and British Columbia, provided funding for certain construction costs, while other provinces contributed by pre-purchasing certain data. The provinces have shared in $355 million of contracts for the construction and development of RADARSAT, including some $172 million in Quebec, $129 million in Ontario, $45 million in British Columbia, and $8 million in Saskatchewan. Various application development programs are providing assistance to companies across Canada to help innovators and entrepreneurs to create and occupy new markets for RADARSAT data.

An agreement with NASA and NOAA provided for the launching and deploying by NASA of the satellite, in return for data provided to US federal departments and agencies. NASA's main requirement is two complete mappings of the Antarctic continent within RADARSAT's projected five-year life.

RADARSAT industrial partners include Spar Aerospace (prime contractor for the building of the satellite), Com Dev, MacDonald Dettwiler & Associates, and subsequently Lockheed Martin. These companies operate RADARSAT International Inc. (RSI) as a joint venture. As the exclusive distributor of RADARSAT data worldwide, RSI has established a growing international network of ground receiving stations so that it can acquire, process and deliver data to clients at speeds as close to real time as possible. RSI pays a royalty to the CSA for all data and derivative products sold, and works closely with the CSA and CCRS to promote and apply RADARSAT data.

RADARSAT INTERNATIONAL

ASC CSA

NASA

RADARSAT in action

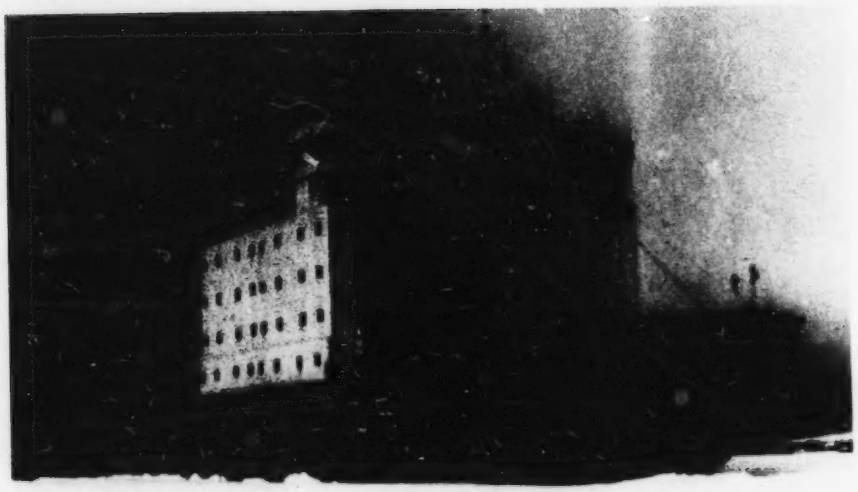
RADARSAT's first year of operation proved many of its unique capabilities.

Rapid, reliable search and rescue support — from pole to pole

RADARSAT responded to a call from the Canadian Coast Guard on August 30, 1996, when the American cruise ship Hanseatic, with 200 people aboard, ran aground in the Arctic Ocean near Prince William Island. The Coast Guard also feared an environmental disaster if the ship's fuel was released into the fragile Arctic environment. RADARSAT images showed the shortest and surest path for Coast Guard ships to reach the scene of the accident. With the rapid response, the incident ended safely, both for the tourists and the environment. RADARSAT also verified that there had been no oil spill.

At the other pole, on February 7, 1997, RADARSAT supplied an ice map to the Argentine icebreaker Almirante Irizar, when it was blocked by ice in the Weddell Sea, and surrounded by 20 icebergs. In only 58 hours after reception of the request, the satellite was programmed, and the images were acquired, processed and delivered, showing the best routes for the ship to get out of its difficult situation.

Also in the Southern Hemisphere, the organizers of the Vendée Globe sailboat race had lost all contact with Canadian sailor Gerry Roufs on January 7, 1997. An ever-widening search zone extending over 20,000 square kilometers and extreme weather conditions made conventional airborne search operations impossible. RADARSAT carried on the search by scanning the entire zone. RADARSAT International processed some 130 images at their expense. The Canada Centre for Remote Sensing (CCRS) applied a special program for detecting boats to some 100 of these images, and several possible positions were provided to Search and Rescue authorities. Sadly, all search efforts failed in that case.



Argentina's icebreaker Almirante Irizar

A new tool for environmental protection

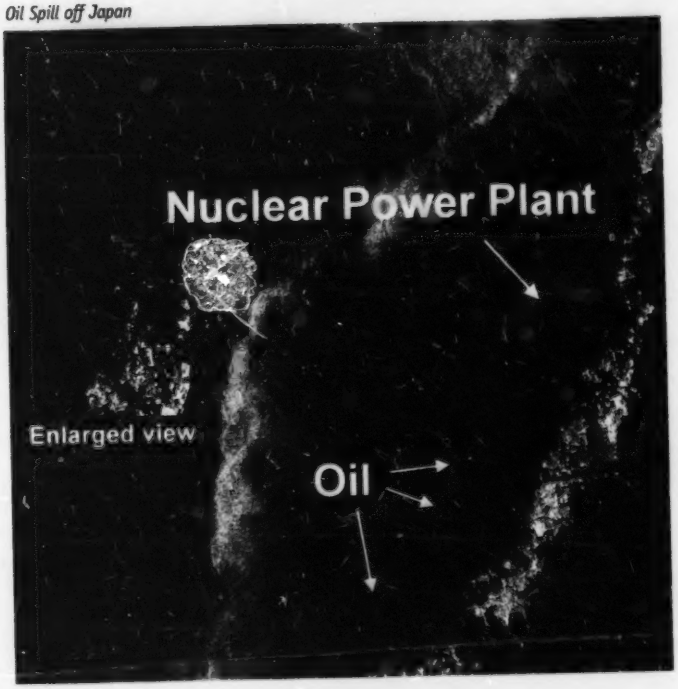
RADARSAT images are proving valuable tool for environmental protection, and a unique resource for combating environmental emergencies anywhere in the world.

On February 15, 1996, before RADARSAT was even declared operational, a giant oil tanker, the Sea Empress, ran aground off the coast of Wales, with a major spill of 70,000 barrels of oil (almost twice the size of the Exxon Valdez spill, in Alaska).

RADARSAT was reprogrammed, and the first images were provided six hours after their acquisition, to guide the protection and clean-up efforts along the coast. This was the first commercial sale of RADARSAT data.

On January 5, 1997, the Russian oil tanker Hakhodka ran aground off the coast of Japan, causing the worst oil spill in that country's history. More than 26,000 barrels of oil threatened to pollute the coastline, as well as foul the intake of several nuclear power plants cooled by sea water. RADARSAT provided 46 SAR images to Japanese authorities to support their efforts in the clean-up operation. About half the images were acquired during the night or in stormy weather, and all were delivered to the Japanese clean-up team within less than five hours from acquisition time. RADARSAT images clearly showed the location, size and dispersion of the spill. Japanese authorities expressed their appreciation for the rapid reaction of RADARSAT, significantly faster than any other satellite, and the quality of the images provided.

Oil Spill off Japan



RADARSAT data is used to assess residual environmental effects of war in Vietnam, in a study by Hatfield Consultants Ltd., a Canadian environmental consulting company, with the help of a RADARSAT User Development Program (RUDP) contract.

Canadian companies already have a significant role in the global market for environmental goods and services — one which is already as large as the global aerospace industry and growing rapidly. In RADARSAT they now have the means to create unique and valuable new environmental services.

Accurate flood monitoring

Flooding on the Red River was high in 1996, and in 1997 caused unprecedented damage. As the flood situations developed, RADARSAT was reprogrammed to maximize the chances of observing critical moments. After processing, the images showed the extent and evolution of the flooding, helped to pinpoint potential weak points, and helped in assessing the damages.

On January 6 and 7, 1997, RADARSAT used two modes and two view angles to measure flooding caused by a dike failure in the San Joachim Valley, in California. The extent of the flooding was calculated by Canadian software developed by Vantage Point International, under the Canadian Space Agency's Applications Development and Research Opportunity (ADRO) program.

RADARSAT images also provide data on snow cover, soil humidity, ice topography on lakes and rivers, and other vital features of the earth's surface. Users of this information include hydrological services, emergency preparedness and environmental organizations, and hydroelectric companies.

Manitoba's Red River in Flood

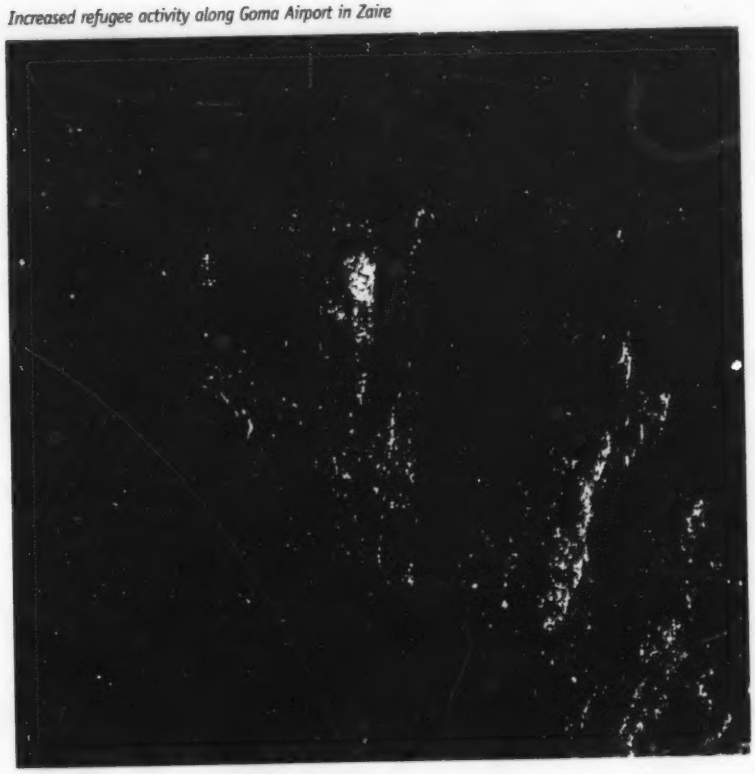
Support to the United Nations

In late 1996, the United Nations Security Council considered a major intervention in the Great Lakes region of Africa. A humanitarian crisis of terrible proportions appeared to be unfolding, with fighting among various armed factions, and hundreds of thousands of people being displaced. Canadian officials played a key role in the UN planning, and RADARSAT technology backed them up.

To assess the need for an expedition and help prepare the way, RADARSAT was programmed to provide overall and detailed images of the region, combining its different scan modes. It tracked refugee movements and showed the situation around the critical Goma airport area.

The incident proved that timely Earth Observation data can be a valuable complement to the efforts of the international community to build peace and provide humanitarian aid.

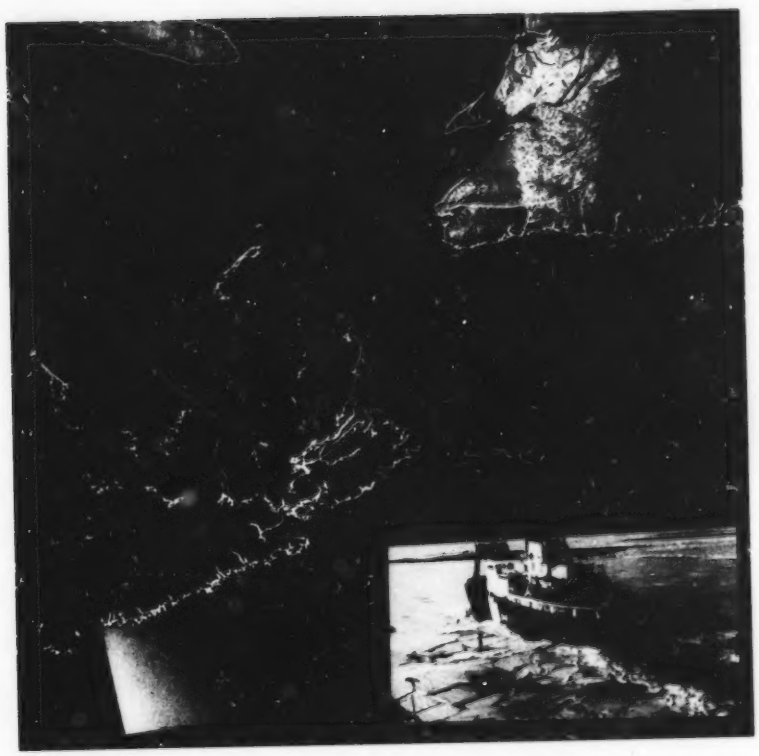
Increased refugee activity along Goma Airport in Zaire



Vastly superior and less expensive ice surveillance

The Canadian Ice Service (CIS) of Environment Canada provides a comprehensive overview of ice conditions for all regions of Canada. There are more than 300 users of its reports, including the Canadian Coast Guard, commercial shipping in the Great Lakes, St. Lawrence, and coastal areas, offshore and inshore fisheries, and oil exploration teams.

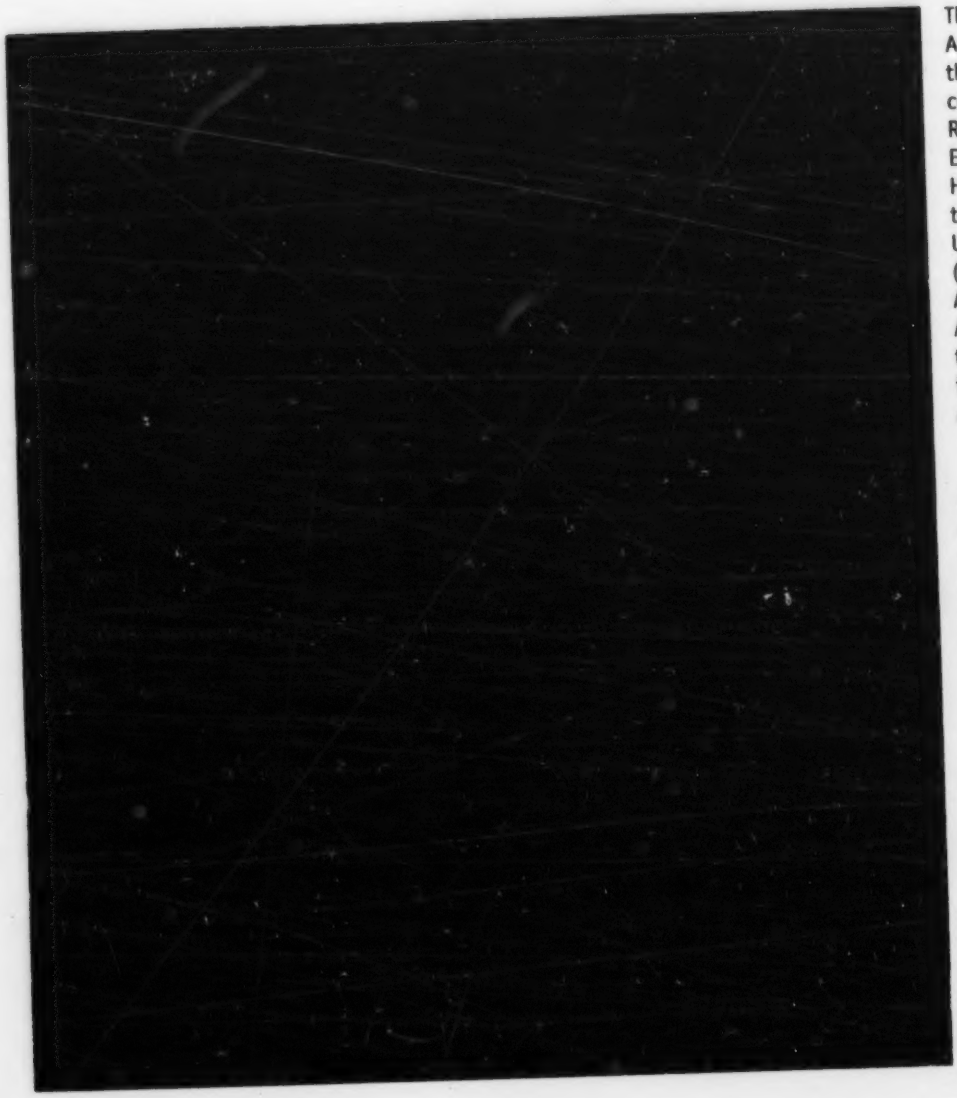
RADARSAT is now the primary data source for the CIS, and over the year from February 1996, it delivered more than 1,500 images. The Ice Centre now compiles an Ice Atlas based on this data. Using RADARSAT has in fact allowed CIS to enhance its product line significantly. For example, the Canadian Coast Guard vessels now receive "imagettes" directly on board via high-speed telecommunications, which help make critical decisions on ship routes. RADARSAT images are making navigation in Canadian waters faster and safer. The use of RADARSAT is estimated to save CIS some $3 million per year, in addition to the thousands of dollars of savings in time and fuel for ship operators. In September 1996, CIS received a Gold Medal of Distinction in recognition of the success of its strategic investment in RADARSAT.



Ice in the Gulf of St. Lawrence

Support for global food production

RADARSAT provides data for assessment of cultivated areas, to forecast yields, determine the need for fertilizer or pesticides, and evaluate the damage caused by tornadoes, hail, or pests. Images that provide water retention level in the soil, for example, are good indicators of crop yields. The main users of these services are government departments, notably agriculture and statistics, as well as banks and lending companies, commodities brokers, and farmers, as well as the agrifood industry in general.



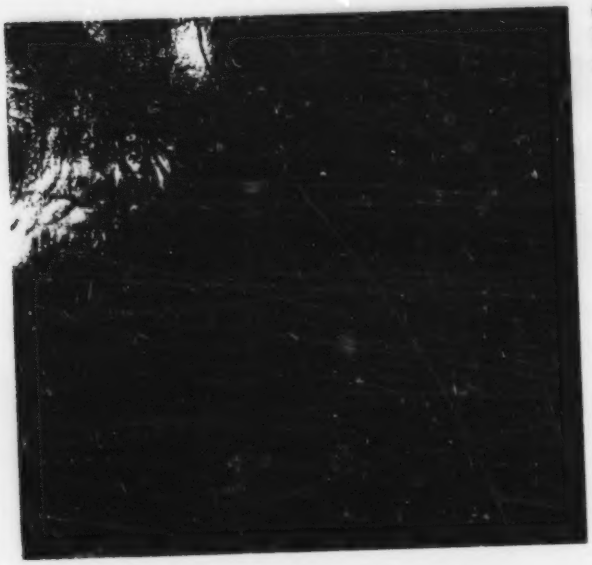
The Canadian Space Agency has encouraged the development of agricultural applications of RADARSAT. It provided PCI Enterprises of Richmond Hill, Ontario with a contract under the RADARSAT User Development Program (RUDP) to create an Agricultural Monitoring & Analysis System (AGROMA) that uses RADARSAT images for crop monitoring and forecasting.

AGROMA application software was developed for researchers, technologists, field scientists, marketing and agricultural specialists, or agricultural administrators. PCI plans to target the monitoring of rice crops South East Asia. The company has already signed a strategic alliance with the International Rice Research Institute (IRRI).

Shuikeng in China's Guangdon Region

New ways to map the world.

RADARSAT is providing unique multi-incidence angle and multi-resolution data for making and updating topographical maps, and has applications in civil engineering projects, forestry and mining operations. Its images are also useful for military operations and for civil security operations.



Interferogram, Bathurst Island, Northwest Territories, Canada

A new tool for resource and land management.

RADARSAT is an indispensable tool for monitoring forests, notably the deforestation of tropical regions. It allows for an inventory of plants and forest types (tropical, boreal, etc.). It is also an ideal tool for planning and overseeing forest operations.

Berbice River, Guyana

There has been great interest in geological maps based on RADARSAT, particularly in Indonesia, Africa, and Latin America. In mineral and petroleum exploration, RADARSAT images are proving very useful. A RUDP contract to develop specialized software for hydrocarbon and coal exploration was given to Intermap Technologies. RADARSAT is effective in detecting water resources, and in the planning of sites, hydroelectric dams, highways, and transmission lines.

RADARSAT data helps regulators evaluate the environmental impacts or resource projects, localize and monitor natural habitats and wetlands, monitor desertification, and assess the socio-economic consequences of this phenomenon. Current use of RADARSAT maps range from monitoring the expansion of densely-populated urban regions to mapping industrial activities in inaccessible regions.

A source of new knowledge about oceans and the weather.

RADARSAT data are used to measure the frequency of ocean swells: this helps to refine existing models of ocean dynamics and their impact on the climate. Such knowledge is directly applicable in the design of coastal and offshore structures, and the safety and planning of their operation; and it is equally applicable in navigation. Climatologists use RADARSAT data to identify fronts between water masses, internal waves, etc. The main users of this knowledge include weather services, researchers in oceanography and fisheries, drilling and diving companies, oil spill fighters, pipeline layers, seismological and marine services.

Ocean Wave and Wind Patterns North of Cape Breton Island

RADARSAT: Year 1 in Review

RADARSAT's commissioning activities, which lasted from launch in November, 1995 until the end of March, 1996, were the satellite's first major challenge. Starting with the flawless launch by NASA, on a Delta II rocket from the Western Test Range in California, results during the commissioning phase continually exceeded expectations.

Picture-perfect launch. RADARSAT was given a picture perfect launch and deployed into its sun-synchronous dawn-dusk orbit at the correct inclination. Very little on-board fuel was required to attain its proper positioning, which was achieved in December, 1995, following calibration of the thrusters and gradual thruster burns. With more fuel left on board than expected, there are now opportunities to use the satellite more extensively, or else to extend the longevity of the satellite. Only 30 days after launch, the first image was produced, an excellent view of Cape Breton Island in Nova Scotia.

In the commissioning period, a full end-to-end operational demonstration was performed. User requests were input through the order desks, images captured, and the required data delivered to clients such as the Canadian Ice Service. These tests proved the proper functioning of both the system interfaces and the operational procedures, and provided performance benchmarks for the spacecraft's five-year mission.

First RADARSAT image (Cape Breton Island)

Extensive testing. Testing continued through the end of March, 1996. Over 1,000 images, representing about 3,000 minutes of on-time, were captured from around the globe, testing all of RADARSAT's imaging modes. About half of the images were downlinked "live", while the rest made use of the on-board tape-recording equipment, which stores image data for later transmission when in range of one of the system's ground stations.

Outstanding accuracy demonstrated. From the images captured during this test phase, it was evident that the absolute image location accuracy of the equipment is outstanding, at ten times the specified requirement. Ground resolution in both range and azimuth exceed specifications by more than 12%. All beam modes within the satellite's 500-kilometer image swath were shown to meet or exceed image quality requirements, in terms of impulse response and location. Products generated by network stations qualified for Blue Ribbon certification.

Operations Commence

RADARSAT production line reaches high gear.

RADARSAT operations inaugurated April 1, 1996. In its first year of official operation, RADARSAT fulfilled more than 11,000 requests for data acquisition, processing and archiving. For these, 8,000 images were processed and delivered to customers. The international client base includes over 500 commercial and government users from 44 countries. RADARSAT is currently responding to about 1,500 real-time or on-board recorder requests each month from around the globe and acquires over 50 new images per day. Processing of images at the Canadian Data Processing Facility in Gatineau reached the rate of 800 images per month.

Among the different RADARSAT beam modes, ScanSAR (notably ScanSAR Wide B) was most often requested (39%,) followed by Standard mode (notably Standard 7) (33%), Fine (8%), Wide (4%), and Extended (1.4%).

Ahead-of-time delivery

According to the original design, RADARSAT was intended to provide four-hour electronic delivery of images to the Canadian Ice Service for production of ice maps for the Canadian Coast Guard. Delivery time is now averaging 1 1/2 hours. Major reductions in delivery time have also been achieved for other major RADARSAT clients.

Substantial archives created

RADARSAT has archived substantial volumes of images for future commercial use. It has mapped all of North America for the first time, using RADARSAT's ScanSAR Wide beam mode. Coverage using the satellite's Standard 7 mode is more than 50% complete. ScanSAR Wide coverage for the rest of the Earth is also extensive: 97% of Europe, 53% of Indonesia, 60% of Indochina and 28% of Africa. The mission objective in this area is to build a uniform archive of global SAR data of interest to the international scientific, government and business user community. Eventually, RADARSAT will have reference images on file for the entire Earth.

Valuable experience obtained.

A six-week outage during the summer eclipse season provided a critical, valuable — albeit unsought and very disruptive — lesson for the future management of this spacecraft.

RADARSAT's "sun synchronous" orbit has been carefully chosen to keep the satellite and its solar power collectors in view of the sun. However, during the summer solstice period, RADARSAT is eclipsed by the earth and loses its exposure to the sun as its passes over the south polar regions. Combined with disturbances from the Earth's magnetic field, and several other factors, this led to Attitude Control System problems, and an extended mission outage that lasted through six weeks in June and July. Some loss of credibility and sales momentum was inevitable, however the system's full recovery and otherwise flawless performance helped RADARSAT to recover rapidly from the setback.

New payload software was successfully uplinked to the satellite in October, which resets automatically to minimize any image losses. No repeat of the problem is expected for future summer solstice periods.

Average RADARSAT system performance, expressed as the percentage of requests planned by the Mission Management Office that were subsequently executed and for which images were delivered, is 95%, and has not been below about 92% in any month since August of 1996. Meanwhile, CCRS ground stations have maintained 99.67% image reception availability over the past year.

Sales: a slow start, then a surge beyond projections

Sales of RADARSAT data in 1996 were affected by the outage, with weeks of unavailability and lost market development momentum. When normal operations recommenced, in August 1996, commercial orders picked up rapidly and constantly. As a result, in First Quarter 1997, sales were 15% above projections. For the month of March 1997 alone, sales reached $1.5 million.

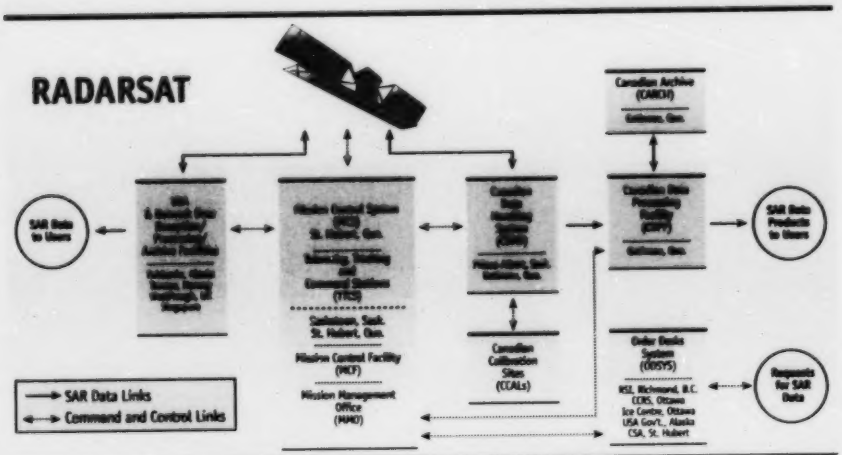
Total RADARSAT Sales[1]	
96Q1	$ 524,000
96Q2	$ 1,340,000
96Q3	$ 963,000
96Q4	$ 2,122,000
97 Q1	$ 3,167,000

1. RADARSAT data and data products, plus royalties from network stations

Nearing capacity, more coming online

RADARSAT-1 is currently performing near full capacity. Capacity will increase, however, as new ground stations come into the network, so the satellite can acquire and downlink images when out of the current network's receiving range.

The ground-station network initially included two stations in Canada — Prince Albert, Saskatchewan, and Gatineau, Québec — and one in Alaska. Two more ground stations were signed on in Fall 1996, WestFreugh (UK) and Tromso (Norway). Singapore was added in March 1997. Agreements have been signed with China and Japan, and numerous others are in negotiation. These additional stations allow more data to be downlinked directly, beyond the limitations of the on-board tape storage system. This will open new global markets for RSI, as it sells the world unique knowledge about itself, gained from space.



RADARSAT Mission diagram

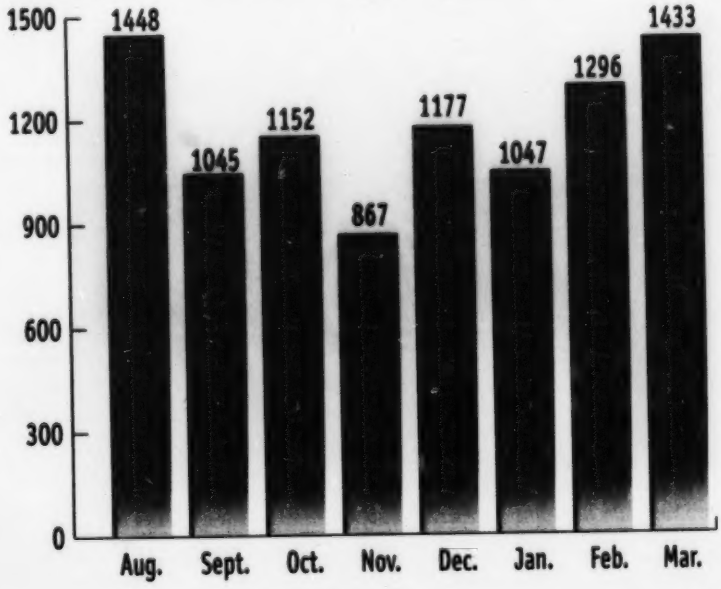
Developing RADARSAT's Network of Users

Developing the applications of RADARSAT data means turning it into useful knowledge and finding the people who can use that knowledge. The Canadian Space Agency, the Canadian Centre for Remote Sensing and RADARSAT International are responsible for developing strategies and implementation plans for new markets with RADARSAT program partners and clients. A wide range of possibilities were addressed in 1996.

Growing market interest. RADARSAT serves an international client base of over 500 commercial and government users in 44 countries. RSI marketing efforts are supported by a rapidly-growing worldwide network of distributors.

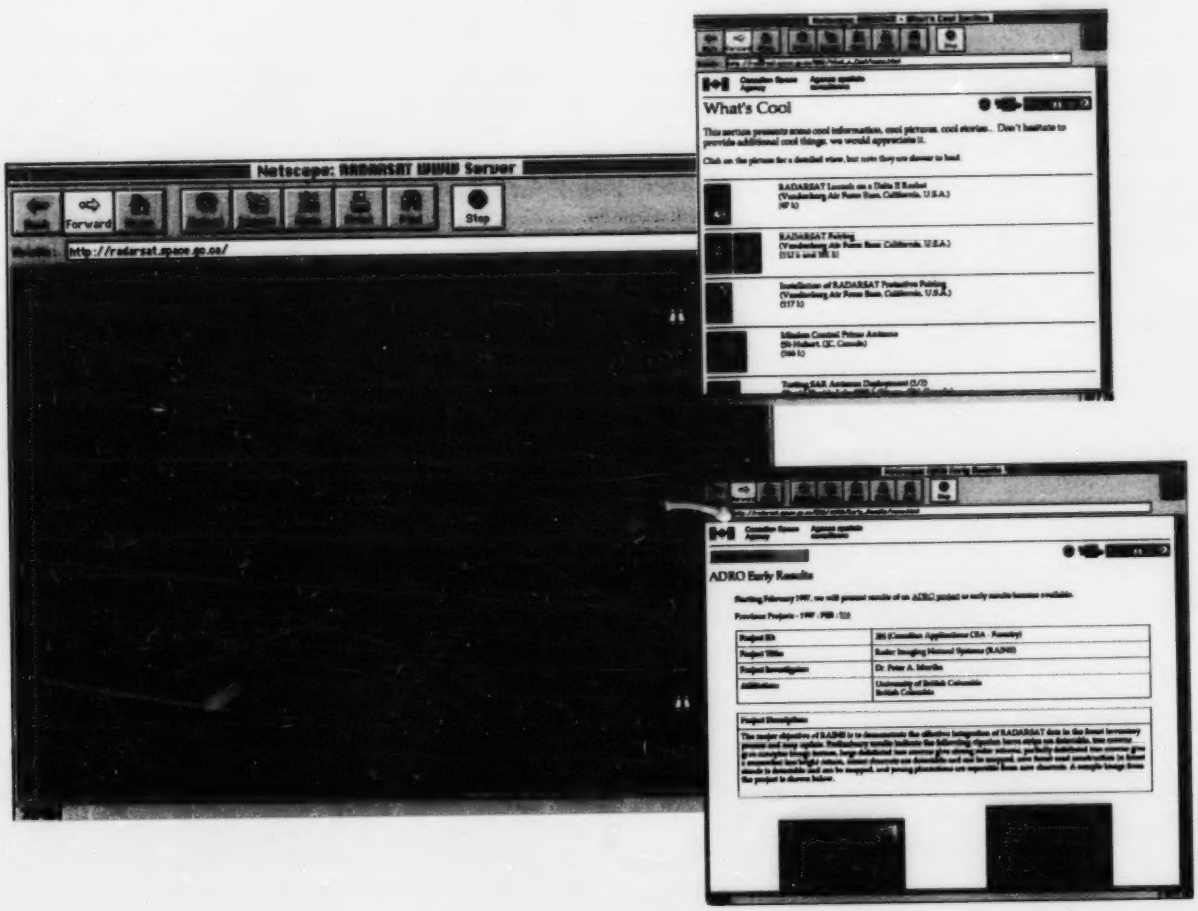
Except for the outage period in Summer 1996, customer inquiries and sales have grown continuously.

Number of images planned by month from August 1996 to March 1997



RADARSAT data appeal to a wide range of user groups. Requests to date have involved, among others, oil and gas exploration in Texas and South America, forest management in Indonesia, flood-disaster assessment in Oregon, oil spill monitoring off the coast of Wales and in the Sea of Japan, rice crop monitoring in China and sea ice monitoring for navigation in Canada's North. RSI hires dedicated experts with marine, geology, land-use, mapping, and defense experience to ensure it has the expertise not only to sell data to clients, but also to help them use it.

CSA, CCRS and RSI promoted the use of RADARSAT data at numerous symposiums, conferences and workshops. The Canadian Space Agency's RADARSAT web site is also a very important window on the world. It was visited 150,000 times during the launch month, and is accessed on average about 75,000 times per month. The site is in continuous growth and development.



Application development programs

Developing the market for RADARSAT data involves reaching users from many diverse user groups, to familiarize them with the satellite's capabilities. It also involves encouraging the creation and development of new applications.

- The Application Development and Research Opportunity (ADRO) program is co-sponsored by the Canadian Space Agency, RADARSAT International and NASA. Under ADRO, seleced projects are provided with RADARSAT data for research and development purposes in diverse areas of the globe. In RADARSAT's first year, over 1,200 images were supplied to more than 160 Canadian-sponsored projects. Over 300 projects in 39 countries qualified to receive SAR data for their studies.

- The RADARSAT User Development Program (RUDP) is a market-oriented program sponsored by the Canadian Space Agency. RUDP supports the development by private industry of new commercial applications using SAR data, which will create a Canadian remote sensing industry and encourage new demand for RADARSAT images. Project proposals have been of very high quality, and 18 were approved.

- The User Education and Training Initiative (UETI) provides funding support for Canadian industry and its partners to develop and market educational and training Earth Observation training materials. The program helps to develop Canadian competence in the design, development and marketing of high-quality training products and services — another high-growth knowledge industry. At the same time, it secures a strategic skill required for addressing the growing global market for remote sensing data. Eighteen UETI projects were under way in the first year.

- The Earth Observation (EO) Pilot Projects Program was set up to accelerate the transfer of EO technology to Canadian industry and to a broader base of user agencies. This focus on technology transfer helps move EO data from the R&D environment into practical sustainable use. Projects that create new services or customize existing data products or services for new markets are encouraged, as are projects that create new products and services out of RADARSAT images. RADARSAT images were being used in 14 of the 19 projects under way during the first year.

- The Earth Observation Data Set (EODS) program provides RADARSAT and other EO data to Canadian researchers to help them develop new data processing algorithms and new commercial products for satellite data. Participation by Canadian universities is encouraged on an ongoing basis, as this is where most of the new advanced algorithms are developed. The first call for proposals resulted in 15 proposals submitted, of which 10 resulted in letters of intent to initiate new research.

- GlobeSAR is a joint program of the Canada Centre for Remote Sensing (CCRS) and the Canadian International Development Agency, now in its second phase. It provides a two-year training and technology transfer package to develop radar expertise in 12 South American countries. The project is being carried out in cooperation with RSI, PCI Enterprises, Atlantis Scientific, and a number of Canadian universities. Countries participating in GlobeSAR include: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Honduras, Nicaragua, Panama, Peru, Uruguay and Venezuela.

How to contact RADARSAT:

The RADARSAT project, led by the Canadian Space Agency, manages Canada's Earth Observation satellite, RADARSAT, now in orbit. You can get in touch with RADARSAT at the following coordinates:

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St. Hubert, Québec
Canada J3Y 8Y9
Tel: (514) 926-4343
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